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**Subject:** Ballast Water TDD Rough Outline  
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Hi Debbie and Mark,

Below is a first cut at an outline for a ballast water management technical development document. The thought is that this document will establish an availability and cost baseline for us to use when developing our BAT analysis for the next VGP while not actually getting into the “economic achievability” assessment. We had wanted to chat with Marcus this week before meeting with you but he was out all last week and most of this week. We are hoping to meet with him early next week to discuss and then work out more specific details at that time. In the meantime though, I would like for you to take a look at this outline and let me know your thoughts/questions about developing such a document. I’m thinking this would be several hundred pages long with many of the contentious issues (i.e., those from the 2<sup>nd</sup> circuit decision) being described in chapter 5. I expect this will include a detailed assessment of off-ship ballast water management options as well as the level of reduction that can be achieved through the different types of management practices (taking into account the quality of information available). We can discuss this on our call this Thursday.

Conceptual Outline

1. Overview (vessel ballasting, invasive species, effects)
2. Laws to address Invasive Species
3. Ballast Water Regulations/Requirements
4. Vessel Universe

Characterizing vessels, including by:

- Size (length/tonnage), including vessels <79 feet in length
  - Age
  - Types
  - Flag State
  - Freshwater/Saltwater Travel
  - Other Characteristics
5. Ballast Water Management
    - a. Best Management Practices, including exchange/flushing
    - b. On-ship Treatment
    - c. Off-ship Treatment
    - d. No Discharge Alternatives
  6. Monitoring Ballast Water
    - a. Ballast Water Composition
    - b. Sampling Considerations
    - c. Analytical Methods
  7. Ballast Water Management Costs
  8. Other Ballast Water Management Considerations
  9. Conclusion

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